

## WHAT IS CLAIMED IS:

1. A communications network comprising a plurality of nodes including at least one earth station and at least one spacecraft, wherein said spacecraft comprises an active node of said network.

2. The network of claim 1 wherein said spacecraft active node includes a physical layer and a link layer conforming to a protocol of an OSI reference model.

3. The network of claim 2 wherein said spacecraft active node further includes a network layer conforming to an OSI reference model.

4. The network of claim 3 wherein said spacecraft active node further includes a transport layer conforming to an OSI reference model.

5. The network of claim 4 wherein said spacecraft active node further includes an application layer conforming to an OSI reference model.

6. The network of claim 1 wherein said spacecraft active node comprises a node operating system (nodeOS) and at least one execution environment (EE).

7. The network of claim 1 including a terrestrial data link.

8. The network of claim 7 wherein said terrestrial data link comprises a Public Switched Telephone Network.

9. The network of claim 7 wherein said terrestrial data link comprises a wireless data link.

10. The network of claim 1 wherein said earth station is configured to transmit at least one object to said spacecraft active node.

11. The network of claim 2 wherein said physical layer and said link layer of said spacecraft active node are configured to communicate with said earth station node using a TCP/IP transmission protocol.

12. The network of claim 11 wherein TCP/IP protocol is transmitted using ATM techniques.

13. A method for dynamically configuring a spacecraft to function as an active node of a communications network, the method comprising the steps of transmitting an object from an earth station to said spacecraft, said object comprising at least one method for configuring said spacecraft to include a node operating system and at least one execution environment.

14. A method for dynamically configuring a spacecraft to communicate over a network comprising at least one earth station and at least one spacecraft in accordance with an OSI reference model, the method comprising the steps of:

transmitting an object from a node selected from the group consisting of an earth station and a spacecraft, to said spacecraft, said object comprising data conforming to at least one protocol, and at least one method comprising executable code for implementing said protocol of said data;

at said spacecraft, receiving said object;

at said spacecraft, extracting at least said executable code from said object;

at said spacecraft, temporarily storing at least said executable code in memory;

at said spacecraft, executing said code for implementing at least one layer of an OSI reference model.

15. The method according to claim 14 wherein said at least one layer comprises a physical layer and a data link layer.

16. The method according to claim 14 wherein said at least one layer comprises a network layer.

5 17. The method according to claim 14 wherein said at least one layer comprises a transport layer.

18. The method according to claim 14 wherein said at least one layer comprises an application layer.

10 19. The method according to claim 14 wherein the step of executing said executable code includes the step of adapting said network layer for at least one of internet protocol and asynchronous transfer mode protocol.

20. A method according to claim 1, wherein said step of executing said executable code includes at least one of the steps of data fusion and packet dropping.

15 21. A communications network including at least one spacecraft node and at least one earth station node, wherein said earth station node is configured to transmit to said spacecraft node at least one object comprising data and a protocol associated with said data, said protocol including information defining at least one node of said network to which said data is to be forwarded from said spacecraft node.